Photosynthetic Electron Transport Inhibition by 2-Substituted 4-Alkyl-6-benzylamino-1,3,5-triazines with Thylakoids from Wild-Type and Atrazine-Resistant Chenopodium album

Ruiko Okano\textsuperscript{a}, Aiko Ohkia\textsuperscript{a}, Shinpei Ohkib\textsuperscript{b}, Hitoshi Kohno\textsuperscript{a}, Jack J. S. van Rensenc, Peter Böger\textsuperscript{b} and Ko Wakabayashia\textsuperscript{*}

\textsuperscript{a} Graduate School of Agricultural Science, Tamagawa University, Machida-shi, Tokyo 194–8610, Japan. Fax: +81-42-739-8854. E-mail: kwaka@agr.tamagawa.ac.jp
\textsuperscript{b} Lehrstuhl für Physiologie und Biochemie der Pflanzen, Universität Konstanz, D-78457 Konstanz, Germany
\textsuperscript{c} Graduate School of Experimental Plant Sciences, Wageningen University, Laboratory of Plant Physiology, Arboretumlaan 4, 6703 BD Wageningen, The Netherlands

\* Author for correspondence and reprint requests

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The effect of 2-benzylamino-1,3,5-triazines on photosynthetic electron transport (PET) was measured with thylakoids isolated from atrazine-resistant, wild-type Chenopodium album, and spinach to find novel 1,3,5-triazine herbicides bearing a strong PET inhibition. The PET inhibition assay with Chenopodium (wild-type and resistant), yielded a resistance ratio (R/W = \text{I}_{50}(\text{resistant})/\text{I}_{50}(\text{wild-type})) of 324 for atrazine while for benzylamino-1,3,5-triazine derivatives of diamino-1,3,5-triazines a R/W of 11 to 160 was found. The compounds having a benzylamino group at one of the amino groups in the diamino-1,3,5-triazines have a resistant ratio down to one half to 1/30 of the atrazine value. The average resistance ratio of 21 benzylamino derivatives of monoamino-1,3,5-triazines was found to be about 4.0. The inhibition of 21 benzylamino-1,3,5-triazines assayed with atrazine-resistant Chenopodium thylakoids, indicated by \text{pI}_{50}(\text{R}) -values, correlated well with the PET inhibition \text{pI}_{50}(\text{W}) of wild-type thylakoids from Chenopodium.